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A plate of Chinese Chestnuts. We sell the trees.

Nut Trees for Cold Climates

Chestnuts

Blight resistant grafted trees. Nuts in a hurry, and lots of them. Wonderful yard trees. A good money crop, a good forage crop.

Grafted Shagbark

Yankee's favorite. Tree for the cold country. Wonderful nuts.

Grafted Hybrid Hickories

Surprising and beautiful trees. Early bearers.

Grafted English Walnut

A favorite for 3000 years, now reawakening with new varieties.

Grafted Black Walnut

Majestic, dignified trees. Nuts for you and your children and your children's children. Furniture for the great-great-grandchildren. Great for the farm lane. A good crop.

Hardy Grafted Northern Pecans

Majestic and fruitful shade. Will make your place a landmark. Nuts with flavor unsurpassed—can crack them in your hand.

Grafted Hiccans—Maple Chasers

Beautiful, towering, gigantic trees that will add distinction to your place.

Pawpaw—A Neglected Native Tree

Beautiful, fruitful, and very ornamental. A striking tree to look upon.

Grafted Mulberry

Cherry saver. Friend of boy and bird, bird that flies, bird that walks.

Grafted Honey Locust

A self-harvesting cow-feed tree. Sugar tree of the future.

Persimmons

Try one and you will wonder why you did not do it long ago.

J. RUSSELL SMITH · ROUND HILL · VIRGINIA

How This Booklet Happened

I was born loving trees. The fact that a distant cousin who lived in Washington, D. C., sold to a neighboring grocer a barrel of English Walnuts almost every year from a tree in his yard, and got 25-30 cents a pound for them, quite heated up my youthful imagination. In 1895 I started farming on a dairy farm in northern Virginia, but I thought it would be a lot easier to make a living picking up English Walnuts from off the grass than it would be to serve as nursemaid to a lot of cows, morning and evening, Sundays and holidays; and so, the very first spring I planted out two acres of English Walnut trees, which I secured from a New Jersey nursery. I also planted some seed from the good tree in Washington, D. C.

The Washington seedlings grew nicely for the first summer, but for some mysterious reason they froze to death the first winter. My two acres of New Jersey seedlings were 3 feet high when planted, 2 feet high the next year, 1 foot high the year after. They were seedlings, probably from imported nuts grown in sunny Italy and they winterkilled in the usual way.

Ten years later 25 acres of grafted paragon Chestnuts were killed by the blight.

After more than 40 years of study and experimenting with nut trees, I now have commercial plantings of Black Walnuts, and am starting commercial orchards of Chestnuts, Pecans, and Shagbarks.

I have learned quite a bit about nuts in that 40 years, and consequently am in a position to save you many years of experimenting by letting you benefit by what I have learned.

During the period of my experimenting a new era has come into nut growing in the northern United States—the era during which we have learned how to graft Walnuts and Hickories. We can now find the one rare tree of Shagbark, Shellbark, Walnut, Chestnut, Pecan, or Hiccan, and by budding or grafting make an orchard of them, just as they do of Baldwin apples or Navel oranges.

This matter of grafting nut trees is a recent acquisition. For years I experimented and got 2 or 3 per cent. One year I had such good success that I had a surplus of trees beyond my experimental needs and started selling them.

Now, as a result of my 40-years' experiments, I can make one general recommendation: Nut trees are grand for your

yard almost anywhere in the United States. By all means plant them. Some varieties are good for commercial planting.

Shade Trees That Bear Nuts

Nut trees are more interesting than maples, as majestic as elms, as beautiful as any tree—and they also bear nuts, nuts that are good to eat or to sell. You cannot say that of maples or elms or any of the common shade trees that grow in our yards.

The time has now come to plant nut trees for shade in dooryard, lawn, lane, pasture, and poultry yard. I can fill out your grounds completely and beautifully, to say nothing of the interest, fun, and profit you will have from the nuts.

Nut Trees for the North

I now have grafted nut trees ready for any tree lover from Maine to Michigan and Minnesota, from Boston to Omaha, from Washington to Memphis, and on down into the Cotton Belt. True, my nursery is in Virginia, but wait—it is in *northern* Virginia, only 95 miles south of the latitude of Philadelphia. It is on the Blue Ridge Mountains, at an *altitude* of 800 to 1400 feet. I have measured 26 inches of snow on the level. We have recently had temperatures of 10° F. or more below zero. Our absolute minimum of record according to the U. S. Weather Bureau is 20° F., which is lower than that of Philadelphia, New York or Boston. But, much more important than these, is the fact that I grow *northern* strains of trees. My Chestnut seeds and varieties came from North China. My Shagbark seed comes from Vermont and Quebec, the varieties from New York, Connecticut, Michigan, and Iowa. My Pecans are grafted on seedlings that grew from Indiana, Missouri, and Iowa seed. The varieties are northern Pecans from near the corner of Indiana, Illinois and Kentucky. Some of my Black Walnuts grow on stocks from Minnesota seed. My Pawpaw seed is from Ohio, Michigan, and Ontario. My Honey Locust seed comes from Nebraska. My Persimmon seed comes from northern Missouri, with varieties that have stood the rigors of Iowa.

Blight Resistant Oriental Chestnuts

If you are 35 or 40 years old and happen to have been brought up in the country almost anywhere between southern

Maine, Buffalo, and western North Carolina, you probably remember your childish delight in seeing the brown shell of Chestnuts glistening in the autumn grass and leaves, the thrill of their smooth surface as your fingers picked them up, one after the other, and filled your pockets and your youthful appetite.

Then you remember the blight, and the sickening sight of the bare arms of dead trees in field and forest.

Now comes the third stage. You can pick up Chestnuts again, if you want to, and you don't have long to wait, for we now have Blight Resistant Chestnut trees all ready for you to plant out in your yard next spring, and they will bear quickly.

The blight came from China, and thus far no single American Chestnut tree has been found completely resistant to it, although many thousands of them still linger on, throwing out generation after generation of suckers to be stricken down by the blight when they have got from 10 to 20 feet high.

To get around this difficulty we have secured seed and trees of the Chinese Chestnut, which has lived for an unknown period of time with the blight and is therefore experienced in the difficult art of outliving it. They are *blight resistant*, but we cannot say that they are blight proof. Neither can we say that of apples.

Thousands of Chinese Chestnut trees have been grown in this country from imported seed, and the usual horticultural process has been applied to them. The best single trees from many thousands have been selected. Scions from these genius trees have been grafted into common roots, and thus we can have orchards of the genius nut trees exactly as we have of fruit orchards.

The test orchards of these Oriental Chestnuts and their hybrids show an almost unbelievable variety of trees and nuts—little, big, and middle-sized; sterile, prolific; bitter, sweet; worthless, grand. Out of the thousands a few varieties have been selected—varieties that are declared to be as good as any American Chestnut ever was, and this by United States Department of Agriculture experts who have no axes to grind, nothing to sell, only their reputations to maintain and the industry to aid.

The Chestnut is the most precocious and productive nut tree known to the Temperate Zone. Nearly all those that are

considered worthy of propagation bear every year. Some of them bear heavily every year. They can be depended upon to bear as soon as apples, some of them sooner. For example, in walking through my nursery I have picked nuts from grafted trees the third summer after grafting, when the trees were only shoulder high. This is not common, but it happens often enough to show what the varieties are like.

The Northern Limit of the Chinese Chestnut

Just how far north will the Chinese Chestnuts thrive? Will they thrive at your place? I wish I could answer these questions with exact and mathematical accuracy, but I cannot, so I give you all the facts I now have and leave the matter for you to work out.

After fifteen years of experience I have never, so far as I know, lost a single Chestnut tree from winterkilling on my Blue Ridge Mountain slope in the Philadelphia climate. Chinese Chestnut trees have thriven and borne for years in Connecticut, some in Massachusetts, a few in southern Vermont. At the same time we get reports of complete winterkilling in those same areas and latitudes. Why this difference? There are three main reasons.

One is: Does your land happen to be in a frost pocket? Few persons realize the profound climatic difference that may exist between your house and the meadow that lies a short distance below it and happens to have poor air drainage. The figures on page 6 show an almost unbelievable difference of temperature on a cold night. Indeed, the range was more than 12° F. in 200 feet difference in elevation—the difference in temperature between 33° (which did not freeze) and 21°, which if kept on long enough would have made ice thick enough to skate upon. I know two innocent looking fields near Washington, D. C. They are in a warmer climate than my Blue Ridge Mountain, but on one of them Chestnuts (which live perfectly for me) winterkill from time to time because it is a frost pocket, and on the other field, a short distance away, they do not winterkill, because it does not happen to be a frost pocket.

The frost pocket trees will get much lower temperatures on still nights in mid-winter. Trees in a frost pocket will have

new growth frozen in late spring while the tree on the overlooking hill escapes.

Trees in a frost pocket will have their leaves killed in the autumn so that they cannot mature their fruit, while the trees on the nearby hill can breathe on for two or three weeks longer and finish up their year's work.

These early autumn freezes that catch a tree while still in active growth are particularly destructive because the tree, being full of sap, may freeze and split the bark. One year I had this happen to a number of Stayman Winesap apple trees under the following conditions. A careless stableman had manured them repeatedly through the summer because they were near the barn, and September had 11 inches of rain; in late October, an unusually early freeze. The heavily manured trees perished; the ordinary orchard escaped. But a few trees at the outlet of roadside drains had benefited by an accumulation of soil and repeated soakings at every rain. They also perished of "winterkill."

Second cause of winter killing—late growth in autumn. See page 14 on English Walnut.

The third reason why we cannot speak yet authoritatively about the northern limit of the Chinese Chestnut is that different trees may differ in the length of the required *rest period* of the tree. Nearly all of our frost-climate trees need frost to put them to sleep in the autumn, and then they will stay asleep until they have had a certain number of hours of cold weather. Now different species *vary in the length of the required rest period*. And in some species the *different trees within the species vary* in this respect. For example, the Elberta peach requires 1000 hours of temperature at 45° F., or lower, during the winter to complete the rest period and resume normal growth under favorable spring temperatures, while the Hiley and other varieties require 700 hours of temperature of 45° F., or lower, in order to finish the rest period, which means that the Hiley will start growing in a warm spell in February, while the Elberta sleeps on, in warm winters.

It seems to be true that some varieties of the Oriental Chestnuts have a shorter rest period than the American Chestnut. It will take a number of years and much experimenting to find out the exact facts in this field. In the meantime we cannot say for certain that the Chinese Chestnut

will grow in the exact northern limit of the American Chestnut. But I am propagating one variety from a tree that has stood unharmed for many years in Connecticut, and the thing for you to do, if you live north of southern Connecticut, is to regard your plantings as experimental. Get a few trees and try them out.

Varieties:

Connecticut Yankee (V)*. Original tree thriving in southern Connecticut. Nuts about $\frac{7}{8}$ —1 inch across.

Zimmerman (V). Original tree near Harrisburg, Pa. Nuts about 1 $\frac{1}{8}$ inches across.

Carr (V). Original tree in North Carolina, but of North China stock. Nuts about 1 $\frac{1}{8}$ inches across.

All these nuts are of beautiful brown color like the native American Chestnut and slightly larger. On an eating test you would have great difficulty in telling which was American and which Asiatic.

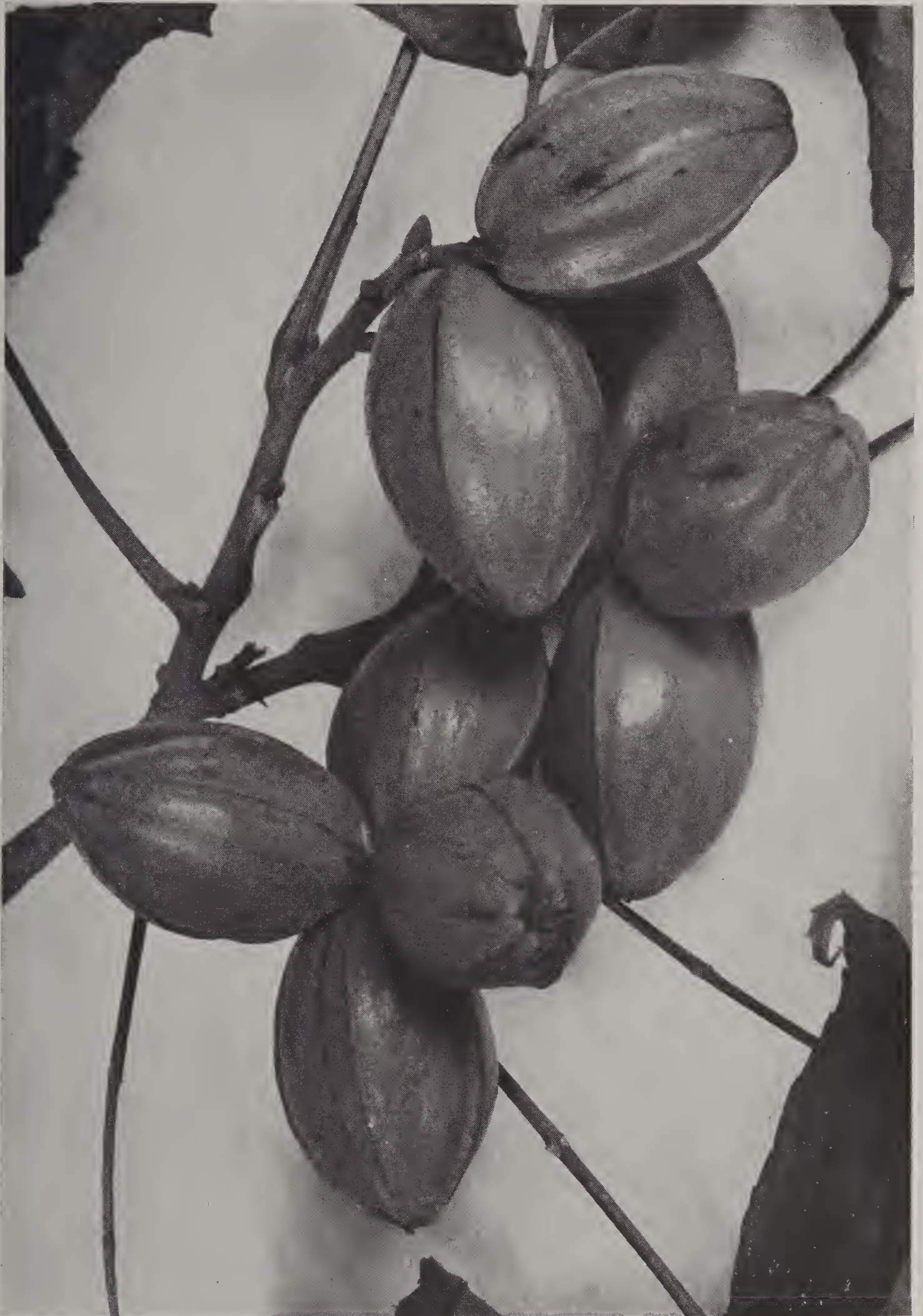
The map of climatic zones on page 7 will be a help to you in deciding what to plant in your location.

Soil and Fertilizer for Chestnuts

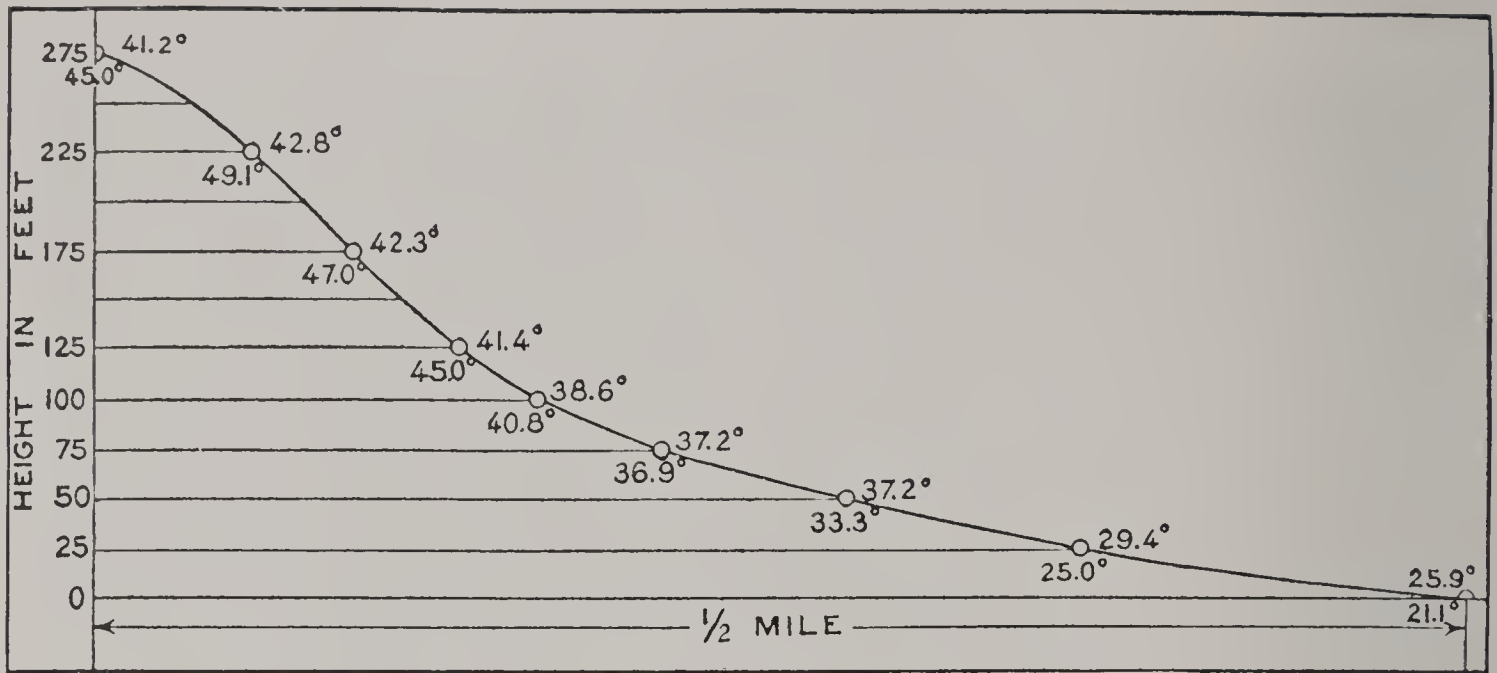
The Chestnut tree, more than any other nut tree, insists on well-drained soil. It will not stand wet feet. It will die in the meadow where the Pecan thrives. It does not particularly object to sandy soil, does not like lime, does not mind some acid, can survive in less fertility than any other nut tree but rejoices in plenty of plant food. One autumn I sent a wagon straddling the rows of little Chestnut trees in my nursery, spreading manure as it went. Next year those trees made from 3 to 4 feet of new growth.

It seems to be a fact that the abundantly fed Chestnut tree is more resistant to blight than a hungry one, so the argument for feed is 100 per cent plausible. Put it on, but put it on in the spring only so that the tree can use it early and go into winter quarters with well ripened wood. Stable manure is unrivalled but a complete fertilizer, 4% nitrogen, 12% phosphorus, 4% potash (4-12-4) is good. And don't let grass crowd the young tree for the first three years of its life. Grass is the best tree killer known except fire and goats. And by the way, the sheep spent a couple of days one dry autumn in my Chinese Chestnut nursery and did not eat the leaves. I can't tell you what they would do to tender young leaves.

* V refers to zone on map, page 7.



Life size Fruiting branch of the Greenriver Pecan tree shown on page 9. We graft Greenriver cions only from this tree.



This figure shows how important it is to keep your trees away from a frost pocket. By watching a row of thermometers all winter a United States Weather Bureau observer got these remarkable facts from a California hillside. The figures above the curve, which represents the slope of the hill, show the average temperatures at the different elevations for 45 clear nights. Figures below the line show temperatures for one clear cold night. The temperatures near the top show the "Thermal Belt" so common on mountain slopes.

Plant Chestnuts

The Chinese Chestnut is a splendid dooryard tree. It is such fun to pick up the nuts. Personally I am planting several hundred trees for commercial Chestnut growing, and I have sold several large orders for that purpose. In one case the purchaser expects to let the pigs harvest the crop. In this respect he will be duplicating the centuries-old experience of southern France, Spain, and Italy, where Chestnut orchards cover whole mountainsides and have supported a rather dense population for more than a thousand years. In these European areas the pig only comes in as a gleaner after the main crop has been picked up for human food and to serve as grain food for horses, cows, sheep and goats.

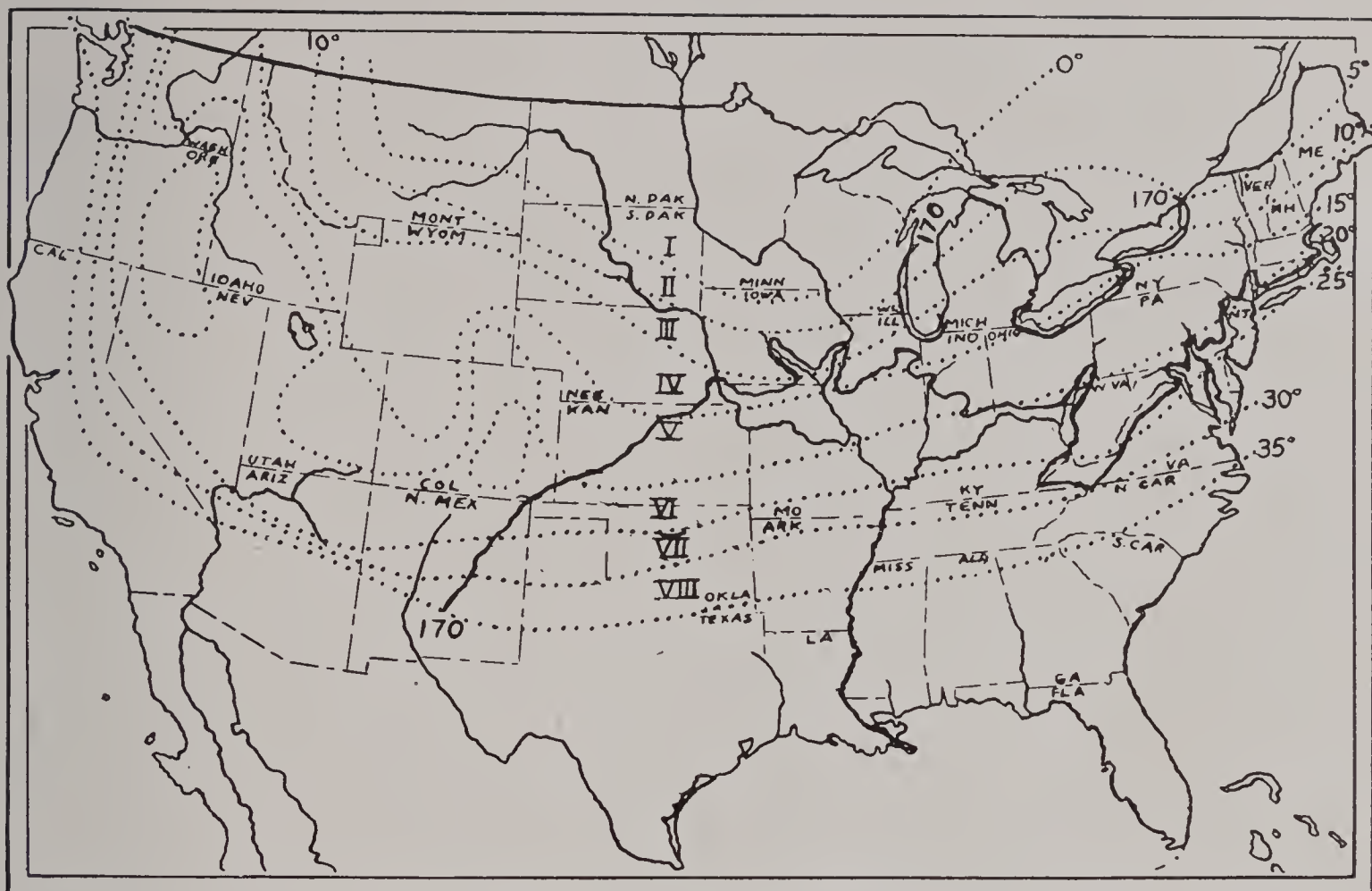
Some of the larger Japanese varieties (trees not yet on the market) promise to give more grain food per acre than can be depended upon from corn. The burrs open, the nuts fall out, and the pigs will do the harvesting, provided we don't eat the nuts ourselves.

The Northern Pecan

If you want to make your place a distinguished landmark, plant two balanced

Pecan trees of the same variety and give them a chance. I have seen these trees towering thirty feet above the tops of the oak forests in Indiana. I have seen them six feet in diameter, with more than 100 feet spread. They are truly lordly trees, and will bear nuts for centuries. One particular tree in southern Illinois was full of nuts when the first white man saw it in 1817. It is reported that it only missed three crops in the next 97 years, and it is still going strong. Ordinarily Pecan trees, like most apple trees, alternate their heavy and light crops.

Many think of the Pecan as a southern tree because trees producing fine nuts were propagated in the South and the industry started in the Cotton Belt. But the Pecan tree grows wild and ripens its nuts in southeastern Iowa, in southwestern Ohio, and thence downstream to the Gulf of Mexico. George Washington called them "Illinois nuts" because the ones he had came from Illinois. He is said to have been very fond of them, often carried them in his pocket and ate them at unexpected times. His diary reports the planting of these nuts, and the trees he planted at Mount Vernon are still thriving.



Map of Climatic Zones from *Manual of Cultivated Trees and Shrubs* by Alfred Rehder of Arnold Arboretum. The figures at ends of lines separating the zones show lowest average temperatures of the coldest single month on record. Look at figure III, and you will appreciate how elevation, air drainage, water bodies and other local conditions may have much influence in affecting the way trees will survive in particular locations. Therefore this map is only an approximate guide. The heavy line (170) marks average length of frost free season of 170 days. Lewisburg, Pa., is just above it on the Susquehanna River. Note this line again near Great Lakes. Remember that this line is an average. Some seasons are shorter and some are longer. In Pennsylvania, a careful study of the records shows that in one-fourth of the years the growing season is three weeks longer than the average. That fact makes it possible for a Pecan tree to come through with an occasional crop much farther north than it can be depended upon to ripen its nuts. But it is an ornament every year. So is every other tree on our list.

Beat George Washington

It is now easy for you to beat George Washington in the *Pecan* business, because you can plant better trees than he could plant. You can plant *grafted* trees. He only had seedlings, and if there is any gamble that is loaded against you it is planting seedling Pecan trees. I've seen a row of them in southern Illinois planted from the best seed they could find. None gave nuts like the original seed, no two were alike, and nearly all were virtually worthless.

You can beat George Washington easily because the tens of thousands of wild trees of the Ohio Valley have been carefully searched, the best trees have been found

and propagated, and you can now buy little trees with every expectation that they will yield nuts which you can crack in your hand, which will yield their kernels in entire halves and have a quality that is not only the equal of any Pecans from the South, but better.

Pecans of Highest Quality

At a national Pecan show at Mobile, Alabama, with all the big Pecans of the South present, the first prize for quality went to a Pecan from the Ohio Valley, the place our varieties originated. Why this high quality? It is a fact well known in horticultural science that many varieties of fruit and nuts often produce their best

MONTHLY AVERAGE TEMPERATURES FROM U. S. WEATHER BUREAU
CLIMATIC SUMMARY OF U. S.

	Altitude	Apr.	May	June	July	Aug.	Sept.	Oct.	Total above 50°
Ithaca, N. Y.....	928	44.8	56.7	65.8	70.4	67.9	61.7	50.2	72.6
Lewisburg, Pa.....	450	49.4	59.9	69.0	73.3	70.8	66.4	51.8	91.2
Mount Weather, Va.*..	1726	44.9	57.1	66.0	70.0	68.2	61.8	51.0	62.3
Washington, D. C.....	75	53.1	64.2	72.7	76.8	74.5	68.1	56.6	121.0
Harrisburg, Pa.....	368	50.7	61.7	70.3	74.5	72.1	64.9	54.0	98.2
New York City, N. Y..	314	48.5	59.4	69.0	74.5	72.8	65.9	55.2	96.8
Hartford, Conn.....	100	46.7	57.5	67.1	71.6	68.9	61.7	51.2	78.0
Albany, N. Y.....	97	46.7	59.2	68.4	72.3	70.5	62.5	50.2	83.1
Pittsburgh, Pa.....	750	51.0	62.6	71.1	74.6	72.5	66.1	54.9	102.8
Columbus, Ohio.....	744	51.1	62.5	71.0	75.2	72.7	66.9	54.7	104.1
Indianapolis, Ind.....	720	52.4	63.3	72.3	76.1	73.9	66.9	55.1	111.0
Evansville, Ind.....	384	55.1	67.0	75.0	78.6	78.1	71.6	59.4	134.8
Madison, Wis.....	860	45.6	57.6	67.5	72.0	69.8	62.3	50.0	79.0
Des Moines, Iowa.....	805	50.6	61.1	70.2	74.9	73.0	65.1	53.3	98.2
Omaha, Nebr.....	1034	50.5	62.5	71.6	76.5	74.4	65.8	54.2	105.5
Topeka, Kans.....	896	53.7	65.0	73.5	77.6	76.0	68.3	56.3	128.4

* Mount Weather is on top of the Blue Ridge near our Nursery. Sunny Ridge Nursery is on the slope of the mountain, elevation 800-1400 feet. According to the rules of the meteorologists it should be between 1½ and three degrees warmer than Mount Weather. Therefore my total above 50° is probably about 73 at the top and 84 at the bottom.

quality near the northern range of the species. The oranges of Florida and California are better than the oranges of Brazil.

The Range of the Pecan

Where will the Pecan grow? It will grow much farther north than it can ripen its fruit. Seedlings from Texas thrive in the climate of Pennsylvania. There are a few healthy old seedling trees in Connecticut. A beautiful tree in a park at Hartford, Connecticut, has a girth of over 11 feet. It is apparently a southern seedling planted in 1858. I have seen lusty Pecan trees in Ontario near Toronto, grown from Georgia seed in a place where they could not possibly ripen their fruit. The Pecan seems to require a large amount of summer heat to bring the nuts through to fruition. One measure of this heat is the total number of degrees of monthly average temperature above 50° F. The accompanying table shows some of these facts.

The varieties I sell have been perfectly

hardy as to winters, and have ripened their nuts at the nursery. After two cool summers in the last twelve years the kernels were not developed fully enough to be commercially marketable, but they were of good flavor for home use.

Now the record at Ithaca (—35° F. winter 1933-34) is that the Pecans and Hiccans that I sell are hardy trees and make beautiful shade but do not ripen their nuts. They do ripen at my nursery and also regularly and satisfactorily at Lewisburg, Pa., 105 miles south of Ithaca and at a slightly lower elevation and with two weeks longer growing season. With this table, and the facts of your own local climate in hand, you can figure out the probabilities of your location better than I can. You will find Dr. Rehder's map (page 7) very helpful, and the U. S. Weather Bureau has records for all sections of the United States.

Therefore, by the aid of this table, you can, by knowing your own climate, decide what the chances are of the Pecan ripening its nuts with you.

Greenriver Pecan tree 2½ years planted in a farm truck patch. Good for 50 lbs. of nuts now and one or two hundred larger crops in the days to come. Note the man.



Another way of testing your climate for Pecans is this: Can you grow dent corn? If so, you should try some Busseron Pecans.

Since the limiting factor on ripening nuts is the number of warm days in the summer and the length of the growing season, there is bound to be a considerable area at the northern edge of the Pecan zone in which the trees will ripen their nuts some seasons while in other seasons they will not. But in any case you can be assured of a beautiful shade tree anywhere from Boston to Niagara Falls and southward. A gentleman from Westfield, N. Y., near Buffalo, writes: "I have Busseron Pecans that came through the winter of 1933-34, the coldest in 60 years." Since the cost is no more than many other shade trees, and they are very beautiful trees, you are quite justified in planting a Pecan where the climate will knock you out of a half or two-thirds of the crops. The other half or third of the crops will be that much more than your maples or your elms will yield.

Soil for the Pecan

The Pecan is a weak feeder. It must have fertile soil if it is to do its best, fertile soil and moisture. In nature it is usually a native of the alluvial lowland, and to get good large nuts you must put it

in a good soil and feed it; feed it as you would a vegetable garden. It will make a beautiful tree in less fertile locations, but it will grow more slowly and bear smaller nuts. The glorious *Greenriver* tree pictured above stands in an upland truck patch on good clay soil. It has benefited by the care of the garden in which it stands.

After it recovers from transplanting, a well-fed Pecan tree will rival the maples in rate of growth.

Shade for the Pasture Field

A Pecan or other nut tree is a perfect shade tree for the pasture lot, and the animals standing under it will automatically fertilize it with their droppings. Such has been the history of many a nut tree with a famous bearing record.

W. C. Reed & Son, of Indiana, are pioneer experimenters with northern Pecans. They report a crop as follows—

"Crop varied from twenty to fifty pounds per tree; think two trees bore seventy-five pounds each.

"Trees were planted twelve years ago on high clay land.

"They have been cultivated regularly.

"Were not fertilized, but were on good, strong land.

"Trees are from thirty to thirty-five feet tall."

You have no overhead charge in pasture shade trees. It is overhead charge that kills so many farm profits.

Twenty or fifty or a hundred pounds of Pecans per tree at a harvest would make your shade trees look good in more ways than one, and Pecan trees live for two or three hundred years.

Planting Pecan trees in a meadow is policy. As soon as the trees are established it is a paid-up policy. That is why I am planting my 50 acres of creek bottom pasture in the Philadelphia climate of Northern Virginia Piedmont.

Pecan Roots

The Pecan tree is not the nurseryman's joy. It has perfectly fiendish tap roots. The first year the little tree is about the size of a straw and the length of a lead pencil, but the root is the size of a lead pencil and twice as long, and I don't know whether the top ever catches up in bulk with the roots. I never saw all the roots of even a three-year-old Pecan tree, and if you had all the roots you would not know what in the world to do with them, because you would have to have a hole probably 5 or 6 feet deep and perhaps 8 or 10 feet wide. Because of this long root habit all our trees are transplanted, but even then digging them up is a major surgical operation. We cut the tops back heavily to balance the loss of root, and expect to pet the trees for the first two seasons while they are getting reestablished. After that they will, if well fed, grow from $1\frac{1}{2}$ to $2\frac{1}{2}$ feet on the terminals per year, and are really very effective shade trees, with a beautiful tropical appearance.

While I am myself planting 50 acres of them commercially in an alluvial meadow pasture near the nursery, I do not recommend the practice to my neighbors, unless they are exceptionally situated. What I recommend to you is one *Kentucky* tree, to be sure you have pollen, and then from two to a dozen *Busserons* and *Greenrivers*, so that you may be sure to have an abundant family supply of delicious, nutritious nuts.

If you are in doubtful territory because of cool summers, omit the *Greenriver* variety because the *Busseron* ripens its nuts earlier than *Greenriver*.

Many nurseries will sell you seedling Pecan trees at a very cheap price. If you buy them with any expectation of nuts, the chances are 999 to 1 that you will be greatly disappointed. You can also buy

very cheap grafted Pecan trees from the South. They will make nice shade, but their nuts cannot be depended upon to ripen north of the Cotton Belt, where they originated.

Pecan Varieties

Busseron (V.* warm locations only in upper edge). Early bearer, early to ripen.

Greenriver (V. lower edge). Slightly plumper kernel than *Busseron* and 10 days later.

Kentucky (V. upper edge). Good pollen producer, good nut, but not so productive as *Busseron* and *Greenriver*.

The Shagbark

Tree for the Northern Range

The Shagbark is the safe, sure tree for the man of the North. The tree grows wild over almost all of northeastern United States.

Tens of thousands of farm boys have delighted to pick up Shagbarks all the way from Maine to Iowa, from Michigan to western North Carolina, and most of these boys have noticed that the nuts from some trees yield their kernels much more easily than others. In fact, the wild nut trees differ almost as much as wild apple trees, with here and there one that might be called a tree genius because its nuts are so much better than the rest.

Search by the Northern Nut Growers Association

This organization of persons interested in nut trees in the North (George L. State, Secretary, Geneva Experiment Station, Geneva, N. Y.) has been offering prizes and searching for the best wild nut trees in America for the last 25 years. As a result of this search many Shagbarks of unusual quality have been found. At least 60 varieties are now under test. Some of them yield many of their kernels in complete halves, so that the time has come for the Shagbark to become a lawn tree of double merit.

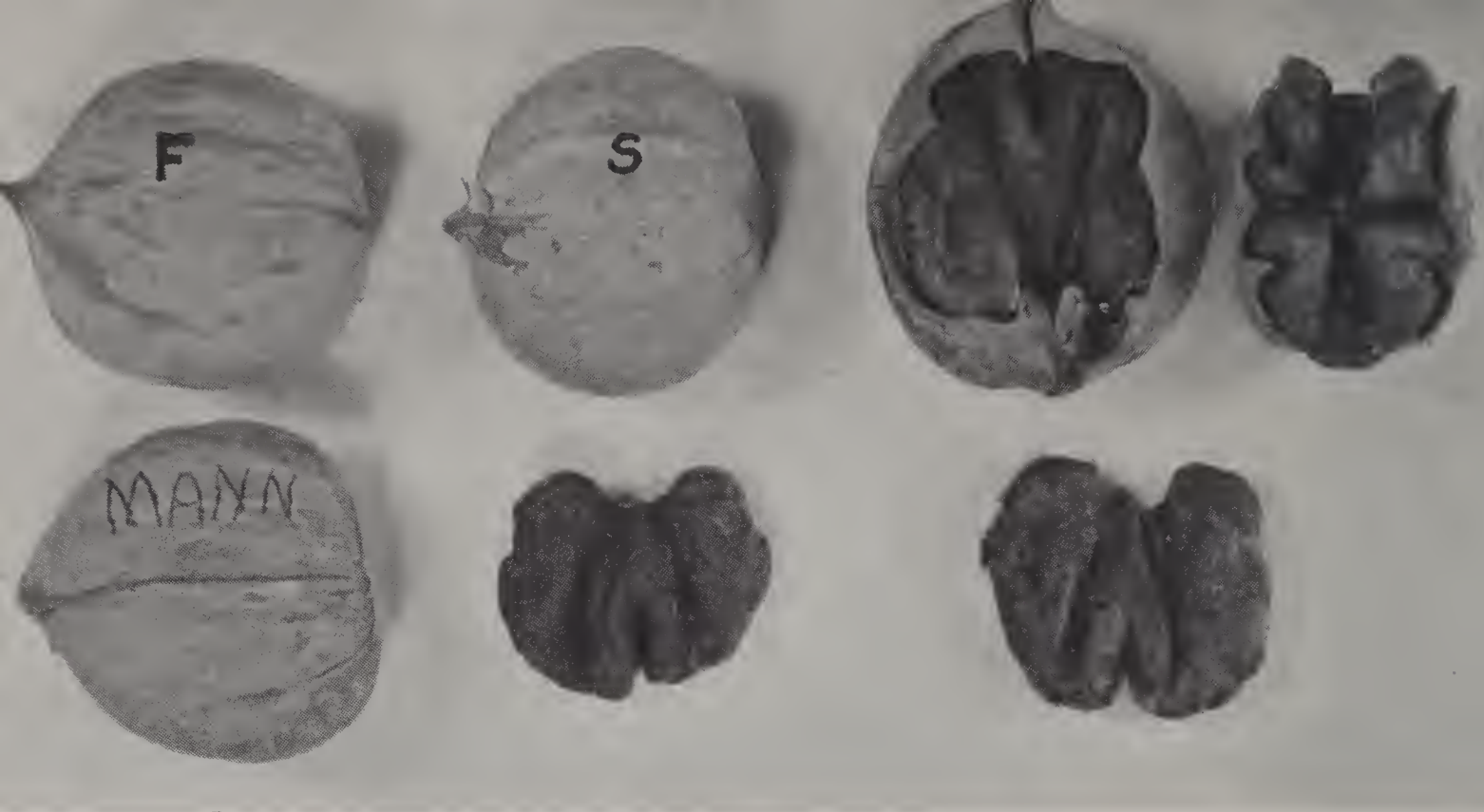
The Growth of the Shagbark Tree

This tree, like the Pecan, also is *not* a nurseryman's delight. We can buy an apple root in December, graft it in February, plant it out in April, and have a

* The Roman V refers to zones on Rehder's Map, page 7.



*Imagine a Shagbark tree like this on your lawn, down your lane or in your pasture,
and three or four bushels of nuts under it.*



Some Shagbarks, life size.

one-year tree to sell in October. With the Shagbark, we buy the nuts in October, plant them in March. In two years we transplant the piddling little tree to keep it from sending its roots clear to China. It takes it about two years to recover from transplanting, after which it begins to grow. In the sixth or seventh year we can graft it. Then the surprise occurs. Some of them will grow 2 or 3 feet a year. Sometimes even more if well fertilized. And if you put a grafted Shagbark in your lawn you can have a big tree much sooner than most persons would expect.

This tree differs from the Pecan in many respects. Not only will it grow in Maine, Vermont, upper New York, Michigan, Minnesota, but it is quite at home on good upland soils, as is shown by the way it grows in rocky upland woods and pastures in a dozen states.

A Good Lawn Tree

Many people for some unknown reason cover their lawns with maples, which annihilate the grass with their dense foliage and multitude of surface roots. The Shagbark, like the Walnut and the Pecan, being a deep rooter, lets grass grow up close to it. Also its tall cylindrical shape is an aid to the grass, and it gives the trees a very distinctive and pleasing appearance.

Fertilizing the Shagbark

Do not let the Shagbark deceive you by the fact that it grows naturally on upland

soils. It likes fertilizer. Its bearing is likely to be very greatly influenced by the amount of plant food. There have been some startling results following the application of an abundance of commercial fertilizer to Shagbarks and other nut trees of the Hickory family. Therefore, I would suggest that you give the tree liberal supplies of fertilizer high in phosphorus and potash. If the tree is 20 feet high I would recommend 5 pounds of a commercial mixture of 4-12-4 or even 4-12-8, and if it is a 30-foot tree, give it 10 pounds, at least every other year. You are likely to be abundantly rewarded.

Shagbark Varieties. I have several varieties of pure Shagbark (see price list), but I cannot at this time say how one differs from the others. (IV, III, west of Lake Huron and favored locations east of it.)

Hybrid Hickories

“What kind of a Hickory is this?” I ask an expert botanist when I get him out in my woods. “Well,” he says, slowly and thoughtfully, “the nut looks something like a Mockernut (*Carya alba*), but the leaf is not exactly a Mockernut leaf, and the bark looks like Tightbark Pignut (*Carya glabra*).” Then his friend the other botanist says, “But look at the number of leaflets and the shape of those branches.” The fact is, the tree is probably a hybrid—a natural hybrid. Indeed, many of the species of our forest trees mix rather freely with each other and produce

hybrid offspring. Owing to the laws of genetics, the nuts from these hybrid trees revert again and make trees like both parents and not like themselves.

Many of the nuts that have come in as candidates for prizes in the Northern Nut Growers Association's contests are hybrids, and fortunately one of the characteristics of some hybrid trees is great vigor of growth. I find that in testing out varieties by topworking them on wild trees in the woods the hybrids are much easier to graft than the purebreds, and two of them which I have for sale are much more precocious and prolific than the purebreds. These two varieties, the *Fairbanks* and the *Stratford*, are both natives of Iowa. Both appear to be at least half Shagbark. Both of them begin to bear in the third or fourth season after being grafted on the wild tree in the woods, and a grafted nursery tree will bear as soon as apple trees or even sooner than some, if properly fed.

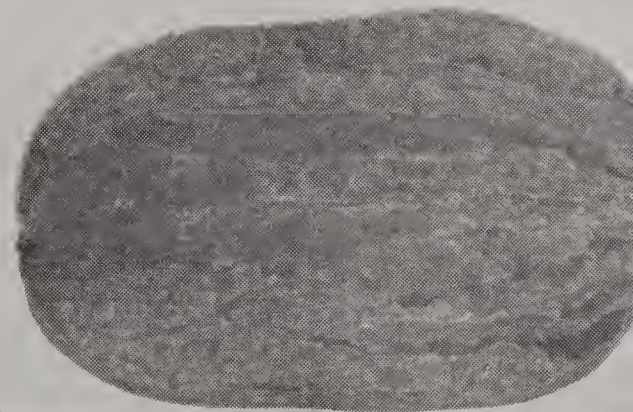
The flavor of these nuts is gratifying, and if you have room for several trees you should certainly have one of each. They seem to be as hardy as pure Shagbarks and can be planted in its range. For the lawn they have all the virtues of the true Shagbark. The *Fairbanks* grows almost as rapidly as a maple tree. *Fairbanks* has lived and ripened in the 40-50 degrees below zero area near Minneapolis.

The experimenter who is going to graft wild trees should by all means use a few *Stratford*. They are so encouraging to the beginner—easy to graft, and they bear so soon, and they keep it up year after year. Some of mine, top-worked on wild trees in a rocky cow pasture, have not missed producing a good crop for six years, including drought years, but the trees were *manured* once.

The Hiccans

The Pecan also indulges in this natural-hybridizing business, and, being a Hickory, there are some natural hybrids of Pecan and other Hickories. These are called Hiccans and I offer for sale three of them which show their hybrid character by growing almost as rapidly as maple trees. That old idea that all nut trees are slow growers certainly does not apply to these Hiccans.

Right up in the northwest corner of Pecan territory, namely, southeastern Iowa, two Hiccans have been found and are now available, under the names of



McCullister Hiccans 8/9 natural si

Burlington and *Des Moines*. The original *Burlington* tree is a giant standing on the banks of the Mississippi River beside the water works of the city of Burlington, Iowa. It has been propagated for some 15 years or more, has proved itself hardy at Minneapolis and Ithaca, N. Y. It is quite up to the fruiting range of the Pecan and probably reaches a little north of it. (III and IV for shade; V for nuts in warm seasons or favored locations; VI, reasonable expectation of nuts in good locations.)

The foliage is of the Hickory type, with a glint of gold on the large dark-green leaves. It is a magnificent lawn tree, and while it is not a heavy bearer, the nuts are of such unusual flavor that I think the nut expert of the United States Department of Agriculture was right when he said that everybody ought to have at least one *Burlington* because it was such a beautiful tree and bears nuts of such excellent quality. A *Burlington* tree adds weight to a landscape.

The *Des Moines*, also from Iowa, has the small, feathery leaf of the Pecan type with leaflets smaller than most Pecan trees. It has a distinctly tropical look, it is probably a better bearer than the *Burlington*, and its nuts might pass for Pecans. This tree also is a rapid grower. It has not been tested long enough to know what its northern range is, but presumably it can go wherever the *Burlington* can, and if you have room for only one of these two trees and are insistent on nuts, I think the *Des Moines* will probably give you more nuts. The *Des Moines* tree gives the sense of feathery lightness and seems to be as hardy as *Burlington*.

From southern Indiana comes the *McCallister Hiccan*, probably a Pecan x Shellbark hybrid, which produces the nut which is at present the largest specimen of the whole Hickory species. This tree is a rapid grower, with very dark-green wax-like leaves. The tree has a tall, cylindrical form, but while the nut is of great size, the tree is a very shy bearer and can be recommended only as a beautiful shade tree, with a scanty crop of nuts which are a true curiosity and also of very high quality. (IV for shade, V for nuts in favored locations.)

The English (Persian) Walnut (*Juglans Regia*)

The trees that give us this delicious nut are supposed to be natives of Persia, from which center they have spread both east and west and circumnavigated the globe. I have seen them in Japan, Korea, China, the valleys of the Himalayas, Persia, Palestine, Syria, Turkey, and then right across Europe from Constantinople to Edinburgh by way of Bulgaria, Yugoslavia, Italy, Switzerland, France, Germany, England. In the eastern United States they are scattered from Massachusetts to Illinois, from New York to North Carolina, while we have a thoroughly established industry with many orchards on the Pacific coast, chiefly in California.

The finest trees I ever saw were in a valley of the Taurus Mountains in

southern Turkey, while the ruins of the Roman city of Baalbek in Syria are bowered in splendid Persian Walnut trees.

To the eastern United States this tree is a foreigner. It is a native of a climate with a mild winter and a dry summer, somewhat like that of California. This may explain the puzzling experience that many people have had with it in the eastern parts of the United States.

There are thousands of trees, nearly all seedlings, therefore each one a law to itself, scattered over the country, east of the Mississippi River, north of the Cotton Belt and south of upper New England and upper Michigan. Encouraged by one of these examples someone buys a tree from a nursery (as I did), probably a seedling of unknown origin, and it usually dies. Yet there is that old tree in So-and-so's garden nearby that lives and bears crops of good nuts. Why did the nursery tree die? Then the tree planter hears that English Walnuts are growing on the shores of Lake Ontario. Hope rises again. He gets a tree from that area, and it may die in Maryland of what is called winterkill, when it had not done so on the shore of Lake Ontario.

Why these puzzling troubles? The answer is now reasonably well known. He has violated one of the three English Walnut "Musts" which are not difficult to follow if we just know. The three English Walnut "Musts" for the eastern United States are:



An English Walnut tree on a lawn in Washington, D. C.



Upper left, Busseron Pecan and Kernel, life size. Lower left, Greenriver, same. The nuts of Burlington and Des Moines look much like the Greenriver.

Upper right, section of Thomas Black Walnut shell. Right center, section of Stabler Walnut shell. Note its extreme thinness. At its left is half its kernel. Lower right, section of Stabler Walnut without middle partition. At its left is all its kernel. Same tree may produce both types.

First "Must": *Get the right variety.*

The first attempt by the uninitiated to get the right English Walnut variety has usually been to get a good nut and plant it. That is the way I began. Now it so happens that the English Walnut tree seems to have an almost greater affinity for the pollen of some other species than for its own. For years a famous Walnut tree stood in Berks County, Pa., producing fine crops of good nuts. The thrifty Pennsylvania German farmers carried them away by the thousand and planted them out, and they invariably got on their trees a sharp, spiny-hulled nut that resembled a butternut. The reason was that this English Walnut tree was pollinated

regularly by a butternut tree that stood about a quarter of a mile away to the northwest.

My first nut tree was an English Walnut seedling. The parent tree is still bearing good nuts, but my seedling froze the first winter. I wonder what its father was?

To get the right kind of an English Walnut tree you must get a grafted tree.

There has been much search among the thousands of trees growing in the United States and there has been general agreement that a variety called the Wiltz-Mayette (V) is probably the best. Certainly it has proved hardy in many an Eastern experimental planting. I have

seen small trees of this variety from my own nursery hanging with as full a crop of nuts as a Black Walnut tree near by was bearing.

I have Wiltz-Mayette trees grafted on Black Walnut roots, and also a very promising new variety called Broadview, the parent tree of which grew from a nut brought to this country by a man from Odessa, Russia. This tree vindicates its Russian origin by surviving 28° F. below zero in British Columbia, and it may in a few years be regarded as the best of all English Walnuts for frost land.

Second "Must": *The soil must be right*, that is, fertile, well drained and *carrying as much lime as is necessary for sweet clover or alfalfa*, namely pH 6.5 to pH 7.0. This lime requirement is not unnatural when one considers that virtually all the soils in countries having the semiarid climate in which this tree originated are somewhat alkaline.

Many a little English Walnut tree has gone out of an American nursery to an American garden or yard where it looked unhappy, stood hesitant despite apparent good care, and finally quit for no known reason—probably for want of lime. Strange to say, this need for lime is necessary for the English Walnut trees grafted on Black Walnut roots, although the Black Walnut tree itself can get along without the lime. Furthermore, one experimenter reports that before a good liming the leafhoppers ate the leaves off his English Walnut tree, and after a liming the leafhoppers let it alone—a good illustration of the oft-claimed point: Give a tree all it needs for food and it will have far less trouble with pests and will be much more resistant to diseases.

The third English Walnut "Must": *No late growth*. The way to kill an English Walnut tree for sure in the latitude of Pittsburgh, New York or Maryland is to cultivate it thoroughly all summer, give it lots of nitrogenous fertilizer like hen manure, and keep it in rapid growth until October. It will go into winter looking like the green bay tree of Scripture and come out looking as though it had been in a fire. This late growth does not have time to harden up and ripen, and so falls an easy victim to frost. Therefore the lawn is an especially favorable place for the English Walnut. If you wish to fertilize it give it some cyanamid or other quickly soluble alkaline nitrate in the early spring—middle of March, say, or not later

than the first of April. Let it make one period of growth and stop. If it is in a garden, don't cultivate it after August 1st. Let the weeds and grass grow and choke it down. Give it plenty of phosphorus and plenty of potash. They harden the wood and make nuts. Let the nitrogen food come from quickly soluble chemicals.

Follow these three easy "Musts" and plant some grafted English Walnut trees and you are likely to be independent of the grocer for English Walnuts. And your *Wiltz-Mayettes* (V) or *Broadviews* (probably IV. Possibly favorable locations in III) will be as good as his.

Grafted Black Walnuts

Everyone knows how good the American Black Walnut (*Juglans nigra*) is, but it is not generally known that it is the best of all nuts for *cooking* purposes. It carries its flavor right through the oven; other nuts do not. This gives it a market with the makers of nut bread, and the confectioners. The ice-cream makers also like to buy the kernels by the ton. For these reasons an industry is starting in the growing of Black Walnuts in commercial orchards.

As a result of wide search through thousands of wild trees, some 50 or 60 varieties are now being tested by various members of the Northern Nut Growers Association. I am offering grafted trees of two varieties:

The *Thomas* (IV, III, west of Lake Michigan) has the following characteristics:

(1) It grows about twice as fast as an apple tree.

(2) It bears as soon as most apple trees. I have had large-size *Thomas* Walnut trees to bear a few nuts the year after setting out. This, however, is unusual.

(3) The outside of the hull is hard. This is an important point. It keeps away most of the Walnut beetles. The larva of this insect is the unpleasant husk maggot.

(4) Most of the kernels come out of the shells in whole quarters, about ten pounds of kernels to the bushel.

(5) The kernels are of unusually fine flavor.

(6) The tree has proved hardy and fruitful in southern Ontario, at Ithaca, New York, near Rutland, Vermont, in Iowa and in west central Texas. A grower at Clyde, Texas, reports eight consecutive crops. May be expected to bear as often as wild Walnut trees bear, and oftener if



Fruiting branch of Kansas Persimmon, natural size.

well fertilized. The Black Walnut loves food.

The *Stabler* (V and favored locations in IV; III, west of Lake Michigan) is not so rapid a grower, but most of the kernels come out in complete halves, and some of the nuts of this remarkable tree yield the kernel in one piece—that is to say, the tree often bears two kinds of nuts. This is a truly remarkable tree. It is also a very beautiful ornamental with a distinctly tropical appearance. Put one in your yard and you will have an interesting feature. Its nuts will be different from anything your neighbors have.

While I recommend the *Stabler* very strongly for lawn use because of its beautiful foliage, symmetrical appearance, and truly remarkable nuts, I do not recommend it for commercial planting because the *Thomas* variety will bear more nuts. Also the *Thomas* tree is by no means so beautiful as a lawn tree.

I think enough of the *Thomas* variety to have planted dozens of the trees in my bluegrass pastures, and I have topworked other dozens along the fence rows and glades, where they have grown up on an abandoned farm that I have bought and use for a pasture.

The Black Walnut is not particular as to soils except that it does not share the Pecan ability to thrive with wet feet. It will grow on your dry hill tops and is not fussy about lime or the absence of it. It responds greatly to fertilizer. Roll it on—horse manure, cow manure, hen manure, chemicals. Roll it on and watch the tree develop dark-green foliage, long new twigs, clusters of nuts.

The Persimmon

Captain John Smith when exploring Virginia was much impressed by the excellence and value of the Persimmon and praised it in his writings. From that time to this it has been eaten freely by every generation of humans that has lived in the Chesapeake country, also by opossums, raccoons, dogs, and every animal on the farms. I cannot understand why so good a fruit, so productive a tree, and one so easy to grow has been neglected so completely by the horticulturists. Perhaps it is because the tree is a veritable pest, growing wild, as it does on the fields, which it holds because no animal will eat its foliage, and the tree itself keeps on coming after much cutting off

of suckers, and even sprouts up from the roots after digging. It grows wild from New York City to Kansas and South nearly to the Gulf. Many of the wild trees load themselves with fruit almost to the breaking point.

A United States Department of Agriculture bulletin reports that it is the most nutritious fruit, excepting the date, grown in the United States. Certainly the farmers who have fought the trees and tried to kill them will attest their easiness to grow, although unfortunately it is not a particularly easy tree to transplant.

The fruit of a good American Persimmon like the varieties I sell is delicious.

It is a very satisfactory yard tree, good to look at, of cylindrical form, spreading not more than about 25 to 30 feet even when 40 or 50 feet tall. In the fall the Persimmons will almost make a balanced ration if eaten with nuts and greens.

From a number of good natives I offer the following :

Early Golden has ripened September 25th, here at Round Hill, Va., whether there had or had not been frost. Some years they keep on ripening for two months. My trees have borne five consecutive heavy crops. If you taste one you want a saucerful. (V questionable at northern edge east of Ohio.)

Kansas. This is an unusually hardy tree. A native of Kansas, it has survived for years at Williamsburg, Iowa, when apples, peaches and pears froze to death. My cions of this variety came from Iowa. (V, and IV, west of Syracuse, N. Y., and III, west of Lake Michigan.)

My experience with this tree is that I might almost call it infernally productive. I grafted a wild one in the pasture, and the next year it was hanging full of fruit, and it has been so every year since, literally staggering under its load.

You should have two varieties for cross pollination, and the fact that they are thriving in Connecticut and in southern Iowa would seem to indicate that they are safe trees to grow as far north as northern Pennsylvania and the southern shores of the Great Lakes, but I cannot exactly draw the northern range limit. In the attempt to make them as hardy as possible, I am growing my trees on seed from Missouri and Iowa.

Persimmons will get by in poorer soil than any other crop I know, but don't be stingy with them. Spring feeding only.



A single cluster of Pawpaws $\frac{1}{2}$ natural size. These fruits were a little less than $\frac{1}{4}$ inch long and the cluster weighed 13 oz.

The Pawpaw

Perhaps you never heard of a Pawpaw. Well, if not, it is time you did, and if you have not it shows how completely we Americans have swallowed European agriculture whole and neglected the things that were at our very door.

The Pawpaw (*Asimina triloba*) is a fruitful lowland tree that grows from New York to Kansas, and from Alabama to southern Ontario. If you have a yard of any size you should have one in it for its sheer beauty. Its compact, firm-looking corrugated foliage has a dark richness not given by any other tree known to me. If you get one on your lawn you will certainly have something that is unique in your neighborhood and unique among trees. In addition to its beauty it has a fruit which has a certain resemblance to the late Theodore Roosevelt—you will *like it* or you will *not like it*. It is a rival to the Persimmon in nutritive quality, looks not unlike a banana, and smells something like a banana. Its taste—well, you will have to taste one to see. Most

people like it very much. It has a rich flavor, a buttery, melting consistency, and if you can get enough of them you may get into trouble with the scales because it will certainly tempt you to eat and grow fat—unless you happen to be one of those few people who do not like that particular flavor. In that case you can make presents to your friends.

The fruits are produced singly, in pairs, sometimes in clusters of four or even more, and I have seen single fruits as much as 6 inches long.

The tree will probably not grow more than 20 or 25 feet high and 10 or 12 feet wide. It can stand partial shade such as would be furnished by a tall Pecan tree, and if you happen to keep a goat you can keep him and the Pawpaw tree together and they will not hurt each other. For some reason not known to us, the foliage seems to be abhorred by all domestic animals. I have a pasture that is littered with Pawpaws. It has been frequented by horses, cows, mules, sheep, and Angora goats. None of them have touched the

Pawpaw unless to use it to brush off flies. You will probably need two trees for pollination. If space is close, they can be planted within a couple of feet of each other and will fuse into one clump. In nature they have a tendency to grow in thickets.

I do not know that the soil requirements are peculiar. It stands out in my open cow pasture, but an annual mulching of leaves 3 or 4 feet in diameter and allowed to rot, would make close resemblance to its commonest habitat.

These trees are not easy to transplant and therefore they need as much care for the first two years as a Persimmon or Hickory. Seedlings only. (V, IV, west of Lake Erie.)

The Mulberry

If you love birds or small boys or hens to the point of wishing to have them around, you should have at least one Mulberry tree on the premises. I have one in my yard that yields fruit from late May until early August, and this fruit is harvested without any trouble to me by birds, boys, and hens. The Mulberry is also good for grownups to eat as well as for boys, and when I want to have a dish of Mulberries and cream, I spread a large sheet under a Mulberry tree, shake the fruit onto it, then roll the Mulberries into a pan.

Some people think that it is a fine thing to have a Mulberry tree so that the birds will eat the Mulberries instead of cherries. I don't vouch for this, but certainly the birds like Mulberries.

The Mulberry tree is one of the most fruitful trees known, particularly the everbearing varieties, like the *Hicks*, which I offer. Perhaps one reason the tree is able to produce such quantities of fruit is the fact that it never carries its whole crop at one time. While some Mulberries are ripe, 1½ inches long, as thick as your little finger, others are little embryos about the size of a grain of wheat, so that the tree that produces a half ton of fruit may never have more than 200 pounds on at one time.

They are certainly a good use to make of the poultry yard space because the chickens love to pick them up and eat them.

In parts of North Carolina an acre or so of Mulberries is a common part of the system for providing the family pork. I have seen farmer after farmer in that

state who was perfectly sure that an acre of everbearing Mulberries, with its 10 to 12 weeks of automatic pig feeding, did him as much good as an acre of corn—and note this—the pigs did the harvesting, while the trees needed no cultivation.

The tree is easy to transplant, a rapid grower, and a great encouragement to the beginning horticulturist because, in addition to these qualities, it gets into bearing very early, and sometimes it will make a second set of buds if the frost kills the first ones. Variety, Hicks. (V, probably IV.)

Honey Locust

When it comes to awarding the first prize for neglected opportunities in American crop plants, we would have a hard run between the Persimmon and the Honey Locust, but I think the prize goes to the Honey Locust because of its great promise as a forage crop and possibly a National sugar supply.

The Honey Locust tree bears beans. Some of them are long beans having sugary nutriment in the pods as well as seeds. Indeed, the Honey Locust pod is one of the richest sugar plants known, and the beans from thousands of different trees in half a dozen different states have been greedily eaten by cattle for decades, and the farmer did not seem to see that here was a great potential crop.

Stock Food That Grows on Trees and Has No Harvest Cost

Some years ago I offered prizes for the best beans and one lot measured 16 inches long, weighed 17 to the pound when bone dry and analyzed 29% sugar. But my prize bean has been eclipsed by those from two trees that have been found by the Tree Crops Section of the Tennessee Valley Authority (Knoxville, Tenn.). They have found two that analyzed more than 32% sugar. That explains why children and farm stock eat these pods so keenly. Miss Williams, the owner of a 400-acre farm in Georgia, reports that she has "a great many trees in pastures where the cattle can pick up the pods as they fall." She makes it a point to set out young trees whenever labor is available in the spring. She also collects pods from trees growing in situations other than pastures and grinds many of these into a cattle meal. She states that by grinding the pods, the seeds are made available for food. She has been utilizing Honey Locust pods for many years.

Young Pawpaw tree. No uncolored picture can show the full beauty of Pawpaw foliage.



Miss Williams estimated that she has several hundred trees on her approximately 400 acres of land, and that the yield in 1934 was approximately 1,500 bushels of pods. She notes that there is a great variation in the characteristics of the various trees on her property.

Miss Williams states that very often several head of young stock are left out all winter to feed on the Honey Locust and that such animals are in excellent condition in the spring.

Another farmer says "and all bear an awful big crop of beans, which the stock like so well that they will break down the fence to get them."

I know one farmer in North Carolina who regularly gathers Honey Locust beans, grinds them in a swing hammer sand machine, mixes them with ground grains as a part of his standard ration for the dairy cows.

I have a few trees grown from cions from the trees producing beans that analyze above 30% sugar. Persons who wish to enrich their pastures and check soil erosion should experiment with these trees.

The farm animals will do the harvesting, although we have the possibility at a later date of growing the nation's sugar supply on these trees and at the same time having cow feed made from the refuse, just as we do from the sugar-beet factory.

The Honey Locust appears to be a kind of goat among trees. It grows farther out in the Great Plains than any other tree, producing a useful harvest, and trees grown from Georgia cions have proved perfectly hardy for the past six or seven years in Connecticut. Therefore it seems to be safe to try out the Tennessee Valley trees as far north as Massachusetts, central New York, southern Michigan, southern Wisconsin.

The stocks upon which mine are grafted are grown from seed produced in Nebraska, where they have resisted heat, drought, blizzards, and extremely low temperatures.

The tree is easy to transplant. I have planted them out in pastures, with very few losses. Don't make the mistake of letting this statement cause you to abuse a good tree.

The Honey Locust is a legume, able with the aid of bacteria to gather nitrogen from the air. This gives it an added value as a tree in the pasture field. Another virtue for the pasture is the thin, open foliage, which lets a great deal of light through, so that grass can grow beneath the tree. In addition to being easy to transplant, the trees are rapid growers. The wood is beautiful, durable and strong.

Some trees of this species are very thorny, but the two varieties I offer are almost thornless, and the tree is a very beautiful yard tree.

Try some, especially if you happen to have the great gift of Curiosity or wish to experiment. There is a full account of the Honey Locust in the book TREE CROPS; see last page this circular.

T.V.A. No. 1. (V. probably also favored locations in IV.)

T.V.A. No. 3. (Same as No. 1.)

Cions for Sale

We will attempt to furnish cions of such things as we can spare. Ten cents per foot postpaid; no order for less than \$1.00; no variety for less than 50 cents.

Owing to the bother that cion shipping involves, we have an annual clean-up cion party on or about March 15th, each year. After that, cion orders must be accompanied by \$1.00 extra for bother charge, and we probably will not have the cions. Strongly advise mailing cion orders promptly March first. It may involve a trip to some distant place in our 500 acres of mountain side.

When to Plant Our Trees

If you plant in the spring plant as early as you can. Don't put it off. Give the tree a chance to get settled into the earth and start its roots to drawing nutriment therefrom. From New York and Pittsburgh southward you can plant in November.

Planting the Tree

Don't buy a good tree and then neglect it. I want my trees to be well treated.

Nut trees have great root systems. It is certainly true that young Hickories and Pecans have *more root than top*. If you had *all* the roots of such a tree you would need a hole almost as deep as a well and as wide as a small house foundation in which to plant it. Transplanting such trees is an act of violence at best. The tops should be reduced to match the reduc-

tion of roots. Therefore, I trim all trees severely unless buyer especially requests otherwise. I also wax the trunks with a thin wax emulsion. This gives transplanting a higher percentage of success because the wax keeps the trunk from sending out so much of the limited supply of moisture.

One of my fellow experimenters planted 700 nut trees in the spring of 1937 and lost 1%, but he wrapped the roots of every tree with wet burlap while carrying it from the bale to the hole. The nut trees do not make fibrous roots of size that can be moved except with ball of earth. It is very important that the roots do not get at all dry in planting.

If you want the tree to forget its old home quickly, dig the hole at least 6 inches deeper than the roots will go. Fill it up 5 inches deep with good rich top soil (no manure in the hole), work into it evenly 5 pounds of bone meal, add one inch of top soil and plant the tree.

In planting the tree be sure that there is room for roots to spread out as far as possible and that earth is carefully worked in so that it touches *every part of every root*. After this is done pour in water until it stands in the hole. Then joggle the roots a little to establish perfect *mud* contact. If you have to carry this water, *carry it*. It's cheap insurance for such a tree.

In filling up the hole leave a basin that will hold two buckets of water, and if the ground slopes make little drains so that shower runoff will run into the basin.

It is an excellent plan to immerse the root end of your unopened bundle of trees in water for the night before you plant them out. The drink they get helps them through the next days.

Care Immediately after Planting

We beg that the trees be protected by clean cultivation or by 3 or 4 foot radius of *straw, strawy manure or paper mulch for the first two years*, and *watered* if drought comes. It is really scandalous the way some people will pay good money for trees and then kill the trees by neglect. *I want your trees to grow*. After the first year put on hen manure (English Walnuts excepted) or other fertilizer and watch them make double or treble growth.

All this may sound a bit fussy, but remember you are winding up something that will run for centuries. George Washington's Pecans are still growing and the



A seedling Honey Locust tree 12 feet high in my pasture. The sheep leave good grass to devour these beans as fast as they fall.

English Walnut trees in a certain forester's yard, in Poland, are said to be 300 years old and yielding 1200 pounds of nuts per tree at a full crop.

We do our best, but like other nurserymen we give no guarantees. In this booklet we have done our level best to state the up-to-date facts, but we would remind our

readers that there is much that we yet need to know about the locations for particular kinds of trees.

References

Round Hill National Bank, Round Hill, Va.; Swarthmore National Bank, Swarthmore, Pa.

Business Address

The nursery is on the mountain side in northern Virginia, but the sales office is in Swarthmore, Pennsylvania.

There are two men at the little nursery who know trees and love them and are expert shippers. At Swarthmore another careful person writes out shipping instructions and answers queries, but there are not many more things that we can tell. This booklet is an attempt to answer all your questions at once. PLEASE DO NOT TELEPHONE OR CALL AT SWARTHMORE ON NUT BUSINESS. We are not fixed to do business that way at Swarthmore Letters will receive prompt attention.

J. RUSSELL SMITH,
Swarthmore, Pa.

If you do not have our price list write for it.

A Book You Will Want to Read:

TREE CROPS, A Permanent Agriculture, by J. Russell Smith, Sc.D.

This book explains how our present crops are annuals domesticated by primitive woman in the buried past. Now that the age of science has come, it shows how our future crops should be grown on trees which are Nature's real engines of food production. The tree is also one of Nature's soil holders.

It shows how anyone may begin it now by planting nut trees and other little-used cropping trees, and also start growing tree food for the beasts—such crops as Honey Locust (grain substitute), Mulberry, Persimmon, Acorn, and many others. This program is a practical one, not just a theoretical set-up. It is based on the author's many years of experience as a practical farmer and also on much observation in four continents.

The book shows how systematic tree breeding may give us the nation's sugar supply from trees, cow feed supply from trees, and possibly even our own bread, factory-made from acorns, which, by the way, are more nutritious than our present bread grains.

If you love trees, or love the earth, or have a constructive imagination, or an interest in science, you will like this book. It will be sent postpaid to any part of the United States for \$1.60. If you don't then want it, send it back in good order at the end of 5 days and your money will be promptly refunded.

Graft Your Own Nut Trees

It is easy, but it requires a special technique. Send 25 cents in stamps for illustrated booklet telling just how to do it. (This booklet is Appendix F of the book *TREE CROPS*, so you don't need both, unless you want this booklet to carry around with you.)